

# **SPECIFICATION**

**Title : Impressed Face Concrete Retaining Wall Product and Manufacturing Technique**

**Cross Reference to Related Applications: None**

**Copyright Statement: Not applicable**

**Federal Research Statement: Not applicable**

**Appendix Data: Not applicable**

**Background of Invention:** Most concrete retaining wall products produced today are manufactured on concrete product machines (Block Machines or Paver machines) and are of a split face design (Siamese manufactured and then split into two or more products) with some type of core hole or protrusion on the product to either lock the product in place or offset it as it is dry stacked in place. Historically retaining wall products are manufactured standing upright in a mold with the face of the unit unseen until the product is stripped from the mold and split in two or more pieces. Because of the way existing concrete products have to be manufactured in an upright position and the inability to put a relief or design on the face of the unit all retaining wall products are

manufactured in basically the same manor. In the production of retaining wall a set height stopping point set into the manufacturing machine determines products or any concrete masonry unit the height of the product. This process typically has room for errors (variance of heights) cycle to cycle. When standard masonry units are laid up they had been manufactured to nominal height and the difference is made up with mortar. In the case of Retaining Wall units they are made to exact (still a variance occurs) height and dry stacked. Any variance is magnified as the height of the wall increases. This variance is usually the reason for rejection of the product.

**Summary of Invention:** This new design is how the product is manufactured and the face is imprinted. This new process makes the product in the face up position with the face or relief being stamped into the product. The process includes using a horizontal core to put a dovetail slot into the back of the product. The dovetail is used for placing a piece of plastic or steel that is slid into the slot to anchor the base course into the ground. On the next layers it is used to either offset the next course or attach it to the previous course. The horizontal cores are also used to put a chamfer on the back of the Retaining Wall block, which allows the product to be placed in a radius design. The chamfer will allow walls to be placed at almost any radius desired. This concept is totally new to the manufacture of concrete retaining wall products because it makes the relief or rock face design with

the stripper shoes and is not split afterwards. The use of a horizontal core to put a chamfer on the back of the block for radius walls is also new. By manufacturing the product in this new way the dimensions of the product are exact and consistent cycle to cycle. Any variation in the height of the product would show up on the face of the unit and not make any difference to the integrity of the wall. The design of the units is also unique to retaining wall products.

**Brief Description of Drawings:** These drawings show several individual units, which would go into the make up of a wall structure. They also show units with straight sides for straight walls and chamfered sides for radius walls.

**Brief Description of Sequences:** Not applicable

**Detailed Description:** In the manufacture of all concrete masonry units whether it be on a Besser, Columbia, Stearns, Omag, Hess, Reikers, Flemming, Zenith, Masa, Knuar, Tiger or any other manufacturer of concrete products machines, some of which are called block machines, some are called paver machines, the sequence of operation and concept of manufacture is the same. The products are made in a mold; the size and configuration will vary depending on the product being produced. There are hundreds of different products and variations on each product. There can be a variation of the materials used in the manufacture of the concrete products, this variation is because of the type of product being manufactured and the availability of aggregates in the area, however all use a combination of cement, sand / gravel / cinders, etc. whatever is available and water to mix the combinations into a semi-dry mix. There may also be some admix or color added to the mix. The sequence of operation is:

1. A mold is placed in the machine
2. A pallet, either metal or wood is positioned under and tight against the bottom of the mold
3. The machine cycles to a point where a feedbox is positioned over the mold
4. Concrete material is dropped or vibrated from the feedbox into the mold

5. A head, comes down containing shoes, is pressed and vibrated into the mold to compact the materials into the mold
6. After a time or setting is reached the machine cycles to a position to strip or push the compacted product from the mold
7. This product is still uncured but solid enough to stay together in it's molded shape. The product is left on a pallet until it is cured enough to be handled
8. After the product is cured enough to be handled it is removed from the pallet and the cycle starts over again

The amount of cycles a machine can make in a day varies from machine to machine and the type of product being manufactured.

In the process of stripping or pushing the product from the mold the sides of the mold have to be straight up and down or tapered out. You cannot press a product through a smaller dimension opening on the bottom than the top. The product would not come out intact. And there is no way to push the product from the bottom up. Because of the way the product has to be removed from the mold, the only product made today with an imprinted top is a paver or stepping stone and these have straight sides and cannot be used for retaining walls. Because of the restrictions on what

products can be produced this way retaining wall products have not produced in this manor.

My design incorporates the use of a horizontal core puller to put a taper on the ends of the block and a dovetail slot on the back or pallet side of the mold. A horizontal core puller is a piece of equipment that attaches to the front, side or back of a concrete products machine and utilizes fingers or tines that are inserted into a mold to make a slot, groove or hole in the product being manufactured. These tines are inserted mechanically through holes in the side of the mold before the material is put into the mold, they stay in position until the product is finished molding and then are pulled backwards from the mold prior to stripping the product. The use of the core puller allows any product to be manufactured at any height desired. Retaining wall products need to be at least six (6) inches deep, from face to back to be of any use. This design allows for the manufacture of these products from six (6) to twelve (12) inches deep from face to back. Numerous designs can be impressed into the face of the retaining wall products using this technique. Retaining wall products have to be easily made and to be able to be laid in a radius to be of any significant value. The existing process does not allow for the face to be impressed into the product. The existing process also depends on the precision of the machine to make the product at a consistent height, with my design the height of the product is

determined by the precision of the mold, which is manufactured to tolerances of +/- .003. The products can be made fast and economically using this process. Retaining wall product are dry stacked as opposed to using mortar between the joints. The tolerances have to be very close for the heights of the units. My design allows for these closer tolerances.